

JUN 01 1993

**INVESTIGATIVE REPORT**  
**ON**  
**SUBSURFACE PETROLEUM CONTAMINATION**  
**AT**  
**CAPITOL MOBIL, 108 STATE STREET**  
**MONTPELIER, VERMONT**  
**VTDEC SITE # 92-1277**

**MAY 28, 1993**

**Prepared for:**

**Premium Petroleum Inc.**  
**32 San Remo Drive**  
**South Burlington, VT 05403**

**Prepared by:**

**Griffin International, Inc.**  
**2B Dorset Lane**  
**Williston, VT 05495**

## **TABLE OF CONTENTS**

### **SECTION**

#### **I. INTRODUCTION**

#### **II. SITE DESCRIPTION**

#### **III. INVESTIGATIVE PROCEDURES**

**A. Monitoring Well Installation**

**B. Groundwater Sampling and Analysis**

**C. Determination of Groundwater Flow Direction and Gradient**

**D. Receptor Survey**

#### **IV. RISK ASSESSMENT**

#### **V. CONCLUSIONS**

#### **VI. RECOMMENDATIONS**

**Appendix A: Site Maps**

**Appendix B: Well Logs**

**Appendix C: Laboratory Results**

**Appendix D: Liquid Level Data**

## **I. INTRODUCTION**

On August 5, 1992, a 1000 gallon underground storage tank (UST) was removed from Capitol Mobil on State Street in Montpelier. The tank contained heating oil. A tank pull inspection was conducted by Wagner, Heindel and Noyes, Inc. of Burlington Vermont, which indicated the presence of petroleum contamination in the surrounding soils. Groundwater was not present at that time. The amount and duration of the presumed leak is not known.

The Vermont Department of Environmental Conservation (VTDEC) requested additional investigation at the site to determine the degree and extent of contamination, identify potential receptors, and prepare conclusions and recommendations based on the results of the investigation. Griffin International Inc. (Griffin) has been retained by the owner, Premium Petroleum Inc., to provide these services. Griffin has prepared this report in compliance with the revised and approved Work Plan dated March 30, 1993.

## **II. SITE DESCRIPTION**

The site is located in downtown Montpelier on the corner of State Street and Taylor Street, which is a dense commercial zone. There are several State office buildings adjacent to the site, as well as a Days Inn Hotel immediately east of the property and a Gulf gas station located across State Street to the north. A site map is included in Appendix A.

Most surfaces are level asphalt paving or concrete sidewalks which drain into several catch basins along the curbs. The Winooski River is approximately 300 feet south of the property and flows east to west.

Montpelier is served by both municipal water and sewer systems, which are located under Taylor Street on the west side of the property. Capitol Mobil connects to these utilities from the west side of the building.

Geologic maps indicate a recent alluvium sand and gravel overburden with dolomite bedrock. Exploratory drilling appeared to confirm this data.

## **III. INVESTIGATIVE PROCEDURES**

In order to further define the extent and degree of subsurface petroleum contamination, Griffin installed two additional groundwater monitoring wells, MW4 and MW5, in the presumed down gradient direction from the former UST. The three existing wells (MW1, MW2, MW3) installed on February 3, 1992, are presumed to be upgradient of the former UST. Water samples collected from all five wells were analyzed to help define the contamination concentrations and migration trends at the site. The site was surveyed to



JUN 01 1993

May 28, 1993

Mr. Richard Spiese  
Vermont Dept. of Environmental Conservation  
H.M.M.D.  
103 South Main St.  
Waterbury, VT 05671-0404

RE: Capitol Mobil, VTDEC Site # 92-1277

Dear Mr. Spiese,

Griffin International has completed the initial investigation of subsurface petroleum contamination at Capitol Mobil in Montpelier, VT. Our enclosed report details the investigative procedures and also includes conclusions and recommendations. If you have any questions, please call anytime.

Sincerely,

A handwritten signature in cursive script, appearing to read "Peter Hack".

Peter Hack  
Engineer

cc: Mr. David Simendinger

provide locations and elevations of major site features, including the five monitoring wells. Water table elevations were also measured to determine groundwater flow data. All collected data is used to study the present contamination levels and predict its effects on the surrounding potential receptors.

#### **A. Monitoring Well Installation**

On April 13, 1993 two groundwater monitoring wells were installed by Green Mountain Boring of Barre, Vermont, under the direct supervision of a Griffin engineer. The wells were installed using a hollow stem auger drill rig. Undisturbed soil samples were collected with a split spoon sampler at five foot depth increments in each well. These samples were field screened for volatile organic compounds (VOCs) with an HNU PI101 portable photo-ionization device (PID). The soil samples were also used to determine subsurface soil characteristics. Drilling and PID screening data are included in Appendix B.

The wells are constructed of 2 inch diameter 0.01" slotted PVC well screen and casing. The annulus between the borehole wall and the well screen contains a silica gravel pack to filter fine sediments from entering the well. The top of the annulus is sealed with a bentonite plug to prevent surface waters from directly entering the borehole. Each well has a locking cap and a flush mounted protective steel cover.

The two wells were strategically located to provide information on the possible migration of contaminants. MW4 was installed in a location that was assumed to be downgradient of the known contamination. This well has been used to determine the vertical and horizontal extent of contamination in this area. MW5 was installed directly in the tank pit excavation. This well has provided data relating to the vertical and horizontal extent of contamination at the apparent source. All five wells have been monitored to determine the groundwater gradient and any paths that the contamination may take.

Soil samples collected from MW4 contained VOC concentrations of 0.4 ppm at a depth of 4'-6' when screened with a PID. At a depth of 14'-16' in this well VOC concentrations up to 130 ppm were detected. Strong petroleum odors were present and the wet soil samples contained visible sheens. The soil samples generally ranged from sand at the surface to silt, coarse sand and gravel at 14'-16' below grade. Bedrock was not encountered.

Soil samples collected from MW5 contained VOC concentrations of 15 ppm at a depth of 4'-6' below grade. PID readings of soils collected at 9'-11' in this borehole indicated VOC concentrations of 200 ppm. At 14'-16' the soils contained VOC concentrations of 100 ppm. This soil sample also had a strong petroleum odor and visible sheens. Soil collected from MW5 ranged from sands, gravel and fills near the surface to coarse sand and gravel at the base of the exploration. Bedrock was encountered at 16' below grade. Soil boring logs are included in Appendix B.

## B. Groundwater Sampling and Analysis

On April 20, 1993, Griffin collected groundwater samples from all five wells on site. The sample collected from MW5 contained approximately 1/8" of free product and therefore was not analyzed at the laboratory. All other water samples (MW1 thru MW4) were collected per Griffin's sampling protocol and analyzed to EPA Methods 8020 and 418.1. The 8020 analysis detects the presence of BTEX compounds (benzene, toluene, ethylbenzene and xylenes) and MTBE (methyl tertiary butyl ether). The 418.1 analysis indicates TPH, or Total Petroleum Hydrocarbons.

The EPA Method 8020 laboratory analysis of the water sample collected from MW1 did not detect any BTEX or MTBE compounds. However, a TPH concentration of 2.0 parts per million (ppm) was detected in this sample by EPA Method 418.1 analysis.

The EPA Method 8020 analysis of the water sample collected from MW2 indicated concentrations of ethylbenzene, toluene, and xylenes of 2070 parts per billion (ppb), 3370 ppb, and 6630 ppb, respectively. A trace of benzene was also detected in MW2. EPA Method 418.1 analysis of the sample from MW2 indicated a TPH concentration of 3.3 ppm.

The EPA 8020 analysis of the water sample collected from MW3 also detected concentrations of BTEX compounds. The lab results indicated concentrations of 1150 ppb of ethylbenzene, 3360 ppb of toluene, 4750 ppb of xylenes and 850 ppb of benzene. EPA Method 418.1 analysis of the sample from MW3 indicated a TPH concentration of 4.1 ppm.

The water sample from MW4 also contained elevated concentrations of BTEX and MTBE compounds. EPA 8020 analysis of this sample detected 95.2 ppb of ethylbenzene, 52.7 ppb of toluene, 114 ppb of xylenes, 166 ppb of benzene and 739 ppb of MTBE. EPA Method 418.1 analysis of the sample from MW4 indicated a TPH concentration of 55 ppm.

Most of the MTBE and BTEX concentrations detected in these water samples are above the Vermont Drinking Water Standards. The VDWS health advisory levels for BTEX and MTBE are 5 ppb for benzene, 680 ppb for ethylbenzene, 2420 ppb for toluene, 400 ppb for xylenes and 40 ppb for MTBE.

The presence of MTBE in monitoring well #4 indicates that a portion of subsurface petroleum contamination at the site consists of gasoline.

Duplicate, trip blank and equipment blank samples indicate that quality assurance and quality control were maintained during sampling and analysis. The QA/QC results are included in Appendix C with the groundwater results.

*High dilution factor  
may be masking  
MTBE present in  
MW's 2 & 3*

### **C. Groundwater Flow Direction and Gradient**

The water table elevations are shown on the Groundwater Contour Map in Appendix D. The elevations are based on an arbitrary datum of 100 feet taken at the top of the casing of Monitoring Well #2. The map indicates that the groundwater appears to be flowing to the south west toward the river as predicted. The average water table gradient in the immediate vicinity is calculated to be 0.3 %. Liquid level data collected on April 20, 1993 is included in Appendix D.

### **D. Receptor Survey**

Griffin conducted a visual survey of the site to locate and identify potential receptors of subsurface petroleum contaminants. Potential receptors identified include the Capitol Mobil building, the storm drain system, adjacent buildings, and the Winooski River. This section of the city of Montpelier is served by municipal water and sewer lines located under Taylor Street. There are no water supply wells in the area.

The Mobil building is built on a concrete slab on grade and is not considered a likely receptor of petroleum vapors originating from subsurface contamination. Other adjacent buildings are believed to have below grade basements that would be considered potential receptors of vapors. To date, there have been no reports of petroleum vapors in adjacent buildings.

The site surface consists of asphalt paving and concrete sidewalks, which drain into a series of catch basins. The outfall of the storm drain was not apparent at the time of this investigation.

The Winooski River is located about 300 feet south of the property. It appears that the groundwater may flow in this direction, however, due to this considerable distance, it is not likely that significant contamination concentrations will reach the river.

## **V. CONCLUSIONS**

Based on the data collected during this investigation, Griffin presents the following conclusions.

- 1) There have been releases of petroleum to the subsurface in the vicinity of Capitol Mobil resulting in soil and groundwater contamination. The flood of 1992 was a major cause of releases in the area from basement heating oil tanks along State Street. It is possible that these releases resulted in soil and groundwater contamination in the area.

2) The 1000 gallon UST, a suspected source of subsurface petroleum contamination, was removed in August 1992. The contents of this tank were not tested and it is not clear if this tank was the source of the MTBE found in MW4.

3) Residual dissolved phase contamination is present in the subsurface at this site. Analysis of the groundwater samples indicate that many wells show concentrations of benzene, ethylbenzene, toluene, xylenes and MTBE to be above the Vermont Drinking Water Standards. However, the analysis of the groundwater sample from MW1, in the southeast corner of the site closest to the Days Inn, did not indicate the presence of petroleum contamination.

*what about  
TPH?*

4) Groundwater in the vicinity of Capitol Mobil flows southwest at a hydraulic gradient of 0.3 %.

5) The only affected receptors detected during this investigation are the soils and groundwater at the site. Other possible receptors include the basement of the state building (hydraulically downgradient and south-west across Taylor Street), the storm water system and the Winooski River.

## VI. RECOMMENDATIONS

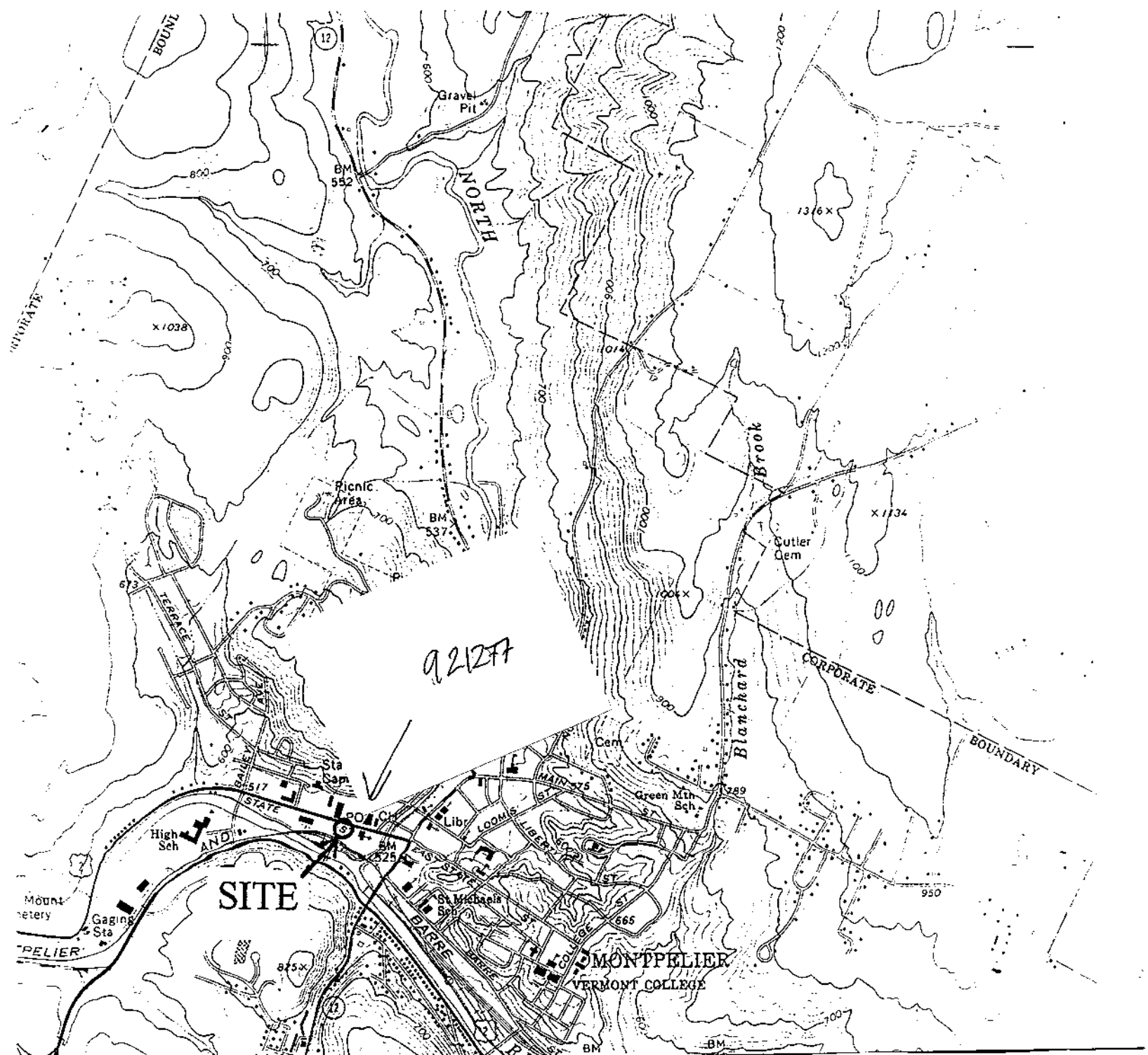
Due to the contamination concentrations that were detected in water samples collected on site, Griffin recommends resampling of the five on-site monitoring wells and screening of the ambient air in nearby basements. Sampling and screening should take place once a quarter for the first year to determine the site parameters and to develop a baseline for monitoring and tracking the contamination. After this data is analyzed, a better determination of the need for future remediation, monitoring or site closure can be made.

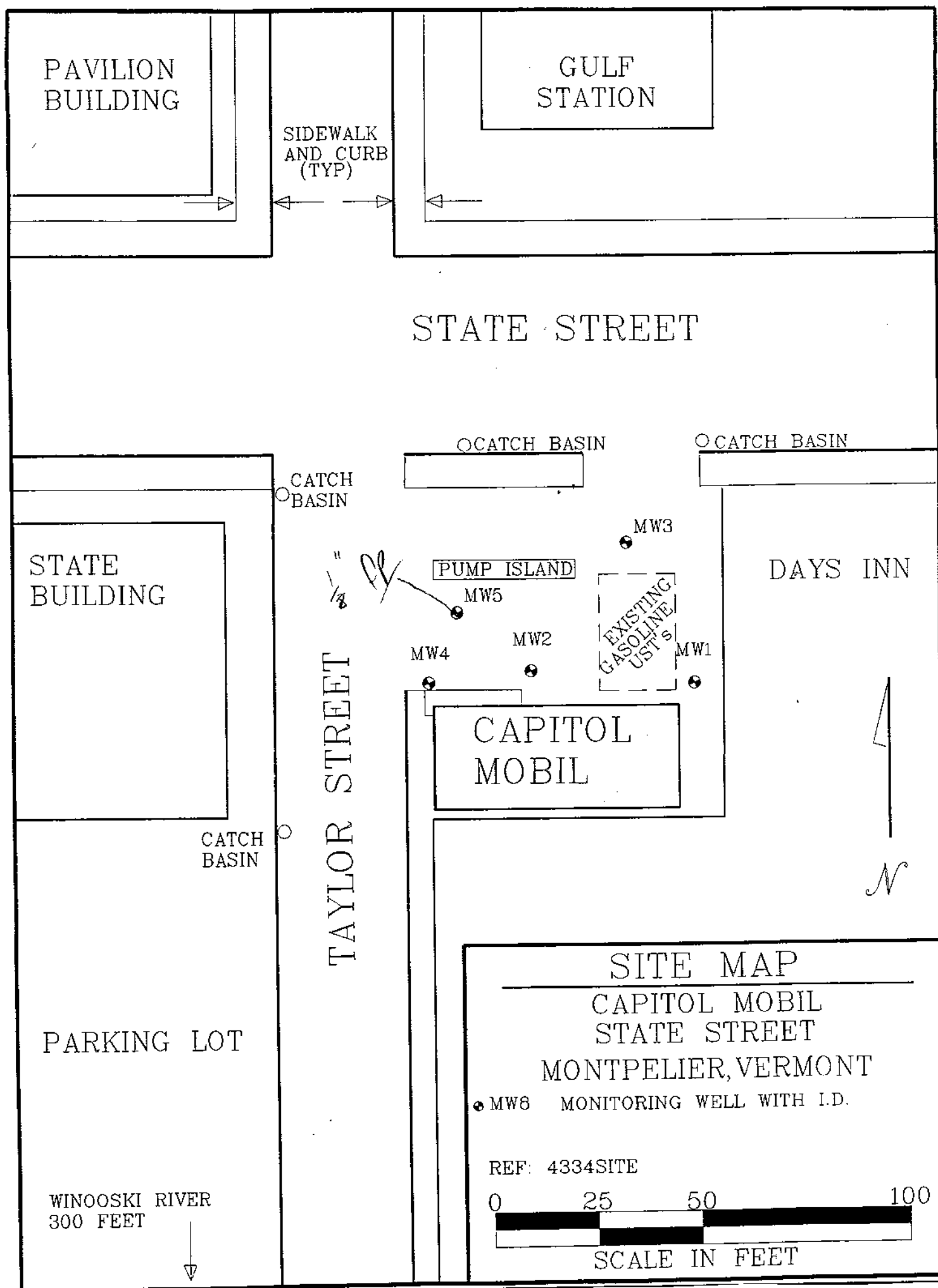


# **APPENDIX A**

**Site Location Map**  
**Site Map**  
**Groundwater Contour Map**

SITE LOCATION MAP  
FOR  
CAPITOL MOBIL  
STATE STREET, MONTPELIER, VT





PAVILION  
BUILDING

GULF  
STATION

SIDEWALK  
AND CURB  
(TYP)

STATE STREET

CATCH BASIN

CATCH BASIN

CATCH  
BASIN

STATE  
BUILDING

DAYS. INN

PUMP ISLAND

MW3  
89.48'

MW5  
89.45'

UST's

MW2  
89.42'

MW1  
89.47'

MW4  
89.34'

CAPITOL  
MOBIL

CATCH  
BASIN

TAYLOR STREET

PARKING LOT

WINOOSKI RIVER  
300 FEET

GROUNDWATER CONTOUR MAP

CAPITOL MOBIL  
STATE STREET  
MONTPELIER, VERMONT

MW8. MONITORING WELL WITH I.D. AND  
92.35' WATER TABLE ELEVATION IN FEET

MONITORING DATE: 4/20/93  
REF: 4334SITE

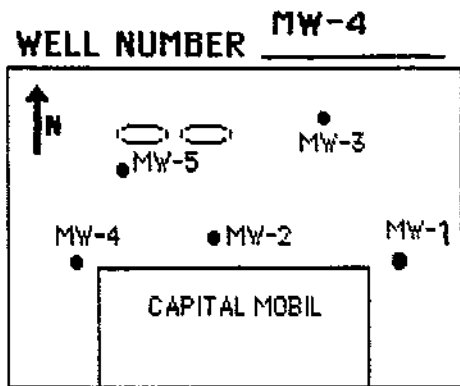
0 25 50 100

SCALE IN FEET

## **APPENDIX B**

### **Well Logs**

PROJECT CAPITAL MOBIL  
LOCATION MONTPELIER, VT  
DATE DRILLED 4/13/93 TOTAL DEPTH OF HOLE 15'  
DIAMETER 6"  
SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"  
CASING DIA. 2" LENGTH 5' TYPE PVC  
DRILLING CO. GRN MT BORING DRILLING METHOD HOLLOW STEM AUGER  
DRILLER MIKE BOB LOG BY P HACK

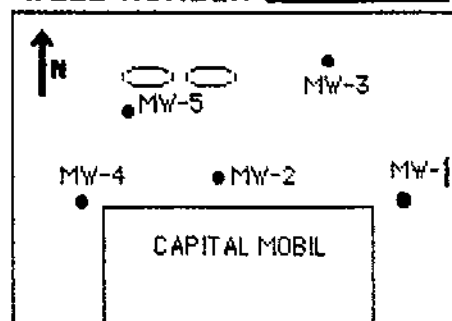


DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" of SPOON and PID readings	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
1		WELL CAP		
2		NATIVE FILL		LIGHT BROWN, DRY, SAND
3		BENTONITE		
4		RISER	4'-6': 10, 6, 3 PID=0.4PPM	BROWN, MOIST, FINE SAND AND SILT SOME STAINING
5				
6		GRAVEL PACK		
7				
8				
9			9'-11': 2, 2, 2, 5	
10		WELL SCREEN		WATER TABLE
11				GOLD-BROWN, MOIST, SILT, STAINS, ODORS
12				
13				
14			14'-16': 7, 5, 10, 5 PID=130PPM	BLACK, WET, COARSE SAND TO GRAVEL STRONG ODORS AND SHEENS
15				
16				BASE OF EXPLORATION @ 16'
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

PID @ 10' =

PROJECT CAPITAL MOBIL  
 LOCATION MONTPELIER, VT  
 DATE DRILLED 4/13/93 TOTAL DEPTH OF HOLE 15'  
 DIAMETER 6"  
 SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"  
 CASING DIA. 2" LENGTH 5' TYPE PVC  
 DRILLING CO. GRN MT BORING DRILLING METHOD HOLLOW STEM AUGER  
 DRILLER MIKE, BOB LOG BY P HACK

WELL NUMBER MW-5



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" of SPOON and PID readings	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX	4'-6': 11, 8, 7, 9 PID=15PPM	ASPHALT
1		WELL CAP		
2		NATIVE FILL		
3		BENTONITE		
4		RISER	9'-11': 3, 1, 1, 2 PID=200PPM	DARK BROWN, DAMP, SAND AND GRAVEL SOME FILL DEBRIS,
5				
6		GRAVEL PACK		
7				
8			14'-16': 4, 5, 13, 17 PID=100PPM	GRAY/GREEN, DAMP, SILT SOME BLACK STAINS, SOME ODORS
9				
10		WELL SCREEN		WATER TABLE ▼
11				
12			BOTTOM OF EXPLORATION @ 16'	
13				
14				BLACK, WET, COARSE SAND AND GRAVEL, STRONG ODOR, SHEENS
15				BEDROCK @ 16'
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

## **APPENDIX C**

### **Laboratory Results**



**ENDYNE, INC.**

## Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993

PROJECT CODE: GICP1394  
REF.#: 44,756 - 44,762

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated samples were preserved with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

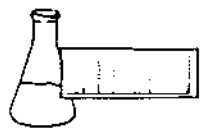
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,756  
STATION: MW-1  
TIME SAMPLED: 12:09  
SAMPLER: J. Bernhard

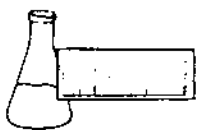
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 100%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

1 None detected



**ENDYNE, INC.**

Laboratory Services

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FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,757  
STATION: MW-2  
TIME SAMPLED: 12:51  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	1000	TBQ <sup>2</sup>
Chlorobenzene	1000	ND <sup>3</sup>
1,2-Dichlorobenzene	1000	ND
1,3-Dichlorobenzene	1000	ND
1,4-Dichlorobenzene	1000	ND
Ethylbenzene	1000	2,070.
Toluene	1000	3,370.
Xylenes	1000	6,630.
MTBE	5000	ND

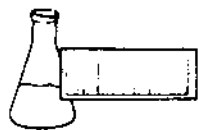
Bromobenzene Surrogate Recovery: 114%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.
- 2 Trace below quantitation limit
- 3 None detected

*revised  
4/29/93  
or per  
6/20/93*



**ENDYNE, INC.**

Laboratory Services

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Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,758  
STATION: MW-3  
TIME SAMPLED: 13:23  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	500	850.
Chlorobenzene	500	ND <sup>2</sup>
1,2-Dichlorobenzene	500	ND
1,3-Dichlorobenzene	500	ND
1,4-Dichlorobenzene	500	ND
Ethylbenzene	500	1,150.
Toluene	500	3,360.
Xylenes	500	4,750.
MTBE	2500	ND

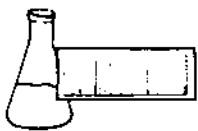
Bromobenzene Surrogate Recovery: 102%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 0.2% dilution.

2 None detected



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Laboratory Services

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Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: May 4, 1993

PROJECT CODE: GICP1394  
REF.#: 44,759  
STATION: MW-4  
TIME SAMPLED: 13:52  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	20	166.
Chlorobenzene	20	ND <sup>2</sup>
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	20	95.2
Toluene	20	52.7
Xylenes	20	114.
MTBE	100	739.

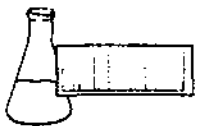
Bromobenzene Surrogate Recovery: 87%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 15

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 5% dilution.

2 None detected



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
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FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,760  
STATION: Duplicate (MW-2)  
TIME SAMPLED: 12:51  
SAMPLER: J. Bernhard

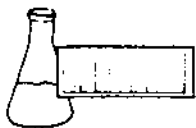
<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	1000	TBQ <sup>2</sup>
Chlorobenzene	1000	ND <sup>3</sup>
1,2-Dichlorobenzene	1000	ND
1,3-Dichlorobenzene	1000	ND
1,4-Dichlorobenzene	1000	ND
Ethylbenzene	1000	2,210.
Toluene	1000	3,520.
Xylenes	1000	7,090.
MTBE	5000	ND

Bromobenzene Surrogate Recovery: 104%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.
- 2 Trace below quantitation limit
- 3 None detected



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
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FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,761  
STATION: Trip Blank  
TIME SAMPLED: 7:50  
SAMPLER: J. Bernhard

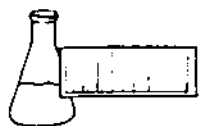
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 99%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

RECEIVED MAY 10 1993

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,762  
STATION: Eq. Blank  
TIME SAMPLED: 14:21  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	TBQ <sup>2</sup>
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 99%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

- 1 None detected
- 2 Trace below quantitation limits





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EPA METHOD 602 LABORATORY REPORT

RECEIVED MAY 10 1993

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 5, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: April 29, 1993

PROJECT CODE: GICP1394  
REF.#: 44,756  
STATION: MW-1  
TIME SAMPLED: 12:09  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Sample(ug/L)</u>	<u>Spike(ug/L)</u>	<u>Dup1(ug/L)</u>	<u>Dup2(ug/L)</u>	<u>Avg % Rec</u>
Benzene	0	10	10.3	11.3	108%
Toluene	0	10	11.0	11.7	113%
Ethylbenzene	0	10	11.4	12.0	117%
Xylenes	0	30	32.3	34.1	111%

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## CHAIN-OF-CUSTODY RECORD

006630

Project Name: <del>San</del> Kapital Mobil	Reporting Address: Griffin 23 Dorset Lane Williston, VT	Billing Address: Same
Site Location: Matpelier, VT		
Endyne Project Number: 1934334 GICP1394	Company: Griffin Contact Name/Phone #: 1-800-252-3353	Sampler Name: John Bernhard Phone #: Same

[illegible]

Relinquished by: Signature <i>John B. C. I</i>	Received by: Signature <i>Chad Reitz</i>	Date/Time <i>4/20/93 3:15 pm</i>
Relinquished by: Signature	Received by: Signature	Date/Time

### Requested Analyses

Requested Analyses											
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										



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# CHAIN-OF-CUSTODY RECORD

FD-6630

Project Name: <del>Capitol Mall</del>	Reporting Address: Griffin	Billing Address: Same
Site Location: Montpelier, VT	3B West Lane Montpelier, VT	
Endyne Project Number: 1934334	Company: Griffin Contact Name/Phone #: 1-800-243-3353	Sampler Name: John Beal Phone #: 802-243-3353

[illegible]

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>4/26/15 1:58 pm</i>
Relinquished by: Signature	Received by: Signature	Date/Time

### Requested Analyses

[illegible]



**ENDYNE, INC.**

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RECEIVED MAY 12 1993

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
DATE REPORTED: May 11, 1993  
DATE SAMPLED: April 20, 1993

PROJECT CODE: GICP1395  
REF. #: 44,763 - 44,769

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated samples were preserved with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

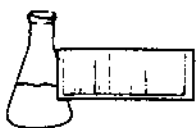
Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures



**ENDYNE, INC.**

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RECEIVED MAY 12 1993

LABORATORY REPORT

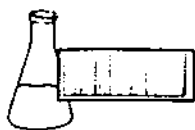
TOTAL HYDROCARBONS - EPA METHOD 418.1 (WATER)

CLIENT: Griffin International  
REPORT DATE: May 11, 1993  
PROJECT NAME: Capital Mobil  
PROJECT CODE: GICP1395  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
DATE ANALYZED: May 10, 1993  
SAMPLER: John Bernhard

<u>Reference #</u>	<u>Sample ID</u>	<u>Conc. (mg/L)<sup>1</sup></u>
44,763	MW 1; 12:09	2.0
44,764	MW 2; 12:51	3.3
44,765	MW 3; 13:23	4.1
44,766	MW 4; 13:52	55.
44,767	Duplicate (MW 2); 12:51	3.2
44,768	Trip Blank; 7:50	ND <sup>2</sup>
44,769	Equipment Blank; 14:21	ND

Notes:

- 1 Method detection limit is 0.8 ppm
- 2 None detected



**ENDYNE, INC.**

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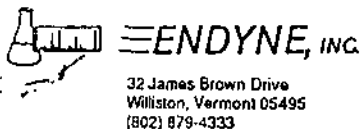
EPA METHOD 418 (WATER) LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Griffin International  
PROJECT NAME: Capital Mobil  
REPORT DATE: May 11, 1993  
DATE SAMPLED: April 20, 1993  
DATE RECEIVED: April 20, 1993  
ANALYSIS DATE: May 10, 1993

PROJECT CODE: GICP1395  
REF.#: 44,763  
STATION: MW-1  
TIME SAMPLED: 12:09  
SAMPLER: John Bernhard

<u>Parameter</u>	<u>Sample(mg/L)</u>	<u>Spike(mg/L)</u>	<u>Dup 1(mg/L)</u>	<u>Dup 2(mg/L)</u>	<u>Avg % Recovery</u>
Total Petroleum Hydrocarbons	2.0	10	10.2	11.9	91.



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## CHAIN-OF-CUSTODY RECORD

006632

RECEIVED MAY 12 1993

Project Name: <i>Capital Mohol</i>	Reporting Address: <i>Griffin</i>	Billing Address: <i>same</i>
Site Location: <i>Montpelier, VT</i>	<i>33 Dorset Lane</i> <i>Montpelier, VT</i>	
Endyne Project Number: <i>GTCP1345 1934334</i>	Company: <i>Griffin</i>	Sampler Name: <i>John Beards</i>
	Contact Name/Phone #: <i>1-800-253-3353</i>	Phone #: <i>same</i>

[illegible]

Relinquished by: Signature <i>John B. [Signature]</i>	Received by: Signature <i>Im Kelly</i>	Date/Time <i>4/26/93 ET 3:55 am</i>
Relinquished by: Signature	Received by: Signature	Date/Time

### Requested Analyses

Requested Analyses											
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										





# CHAIN-OF-CUSTODY RECORD

Project Name: <i>Croft Plot 1</i>	Reporting Address: <i>Croft Ln</i>	Billing Address: <i>5</i>
Site Location: <i>Montpelier, VT</i>	<i>23 West Lane</i> <i>Montpelier, VT</i>	
Endyne Project Number: <i>1034334</i>	Company: <i>Croft</i>	Sampler Name: <i>John Smith</i>
	Contact Name/Phone #: <i>1-800-252-3753</i>	Phone #: <i>1-800-252-3753</i>

[illegible]

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>4/28/53 4:30 pm</i>
Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time

## Requested Analyses

[illegible]



## **APPENDIX D**

### **Liquid Level Data**

